

## 2.13 Sequences

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Find the first 6 terms and the 100<sup>th</sup> term of the explicitly-defined sequence. Show work!**

1.  $u_n = \frac{n+1}{n}$

2.  $v_n = \frac{4}{n+2}$

3.  $c_n = n^3 - n$

4.  $d_n = n^2 - 5n$

**Find the first 4 terms and the eighth term of the recursively-defined sequence. Show work!**

5.  $a_1 = 8$  and  $a_n = a_{n-1} - 4$ , for  $n \geq 2$

6.  $b_1 = 2$  and  $b_{k+1} = 3b_k$ , for  $k \geq 1$

7.  $c_1 = 2$ ,  $c_2 = -1$ , and  $c_{k+2} = c_k + c_{k+1}$ , for  $k \geq 1$

**The sequences are arithmetic. Find a) the common difference, b) the tenth term, c) a recursive rule for the  $n$ th term, and d) an explicit rule for the  $n$ th term. Show work!**

8.  $6, 10, 14, 18, \dots$

9.  $-4, 1, 6, 11, \dots$

10.  $-5, -2, 1, 4, \dots$

11.  $-7, 4, 15, 26, \dots$

**The sequences are geometric. Find a) the common ratio, b) the eighth term, c) a recursive rule for the  $n$ th term, and d) an explicit rule for the  $n$ th term. Show work!**

12.  $2, 6, 18, 54, \dots$

13.  $3, 6, 12, 24, \dots$

14.  $1, -2, 4, -8, 16, \dots$

15.  $-2, 2, -2, 2, \dots$

16. The fourth and seventh terms of an arithmetic sequence are -8 and 4, respectively. Find the first term and a recursive rule for the  $n$ th term. Show work!

17. The second and eighth terms of a geometric sequence are 3 and 192, respectively. Find the first term, common ratio, and an explicit rule for the  $n$ th term.

### Review Exercises

Solve the equation algebraically. State the restrictions and identify any extraneous solutions. Show work!

18.  $x + 5 = \frac{14}{x}$

19.  $2 - \frac{1}{x+1} = \frac{1}{x^2 + x}$

20.  $3(x-2)^{\frac{3}{4}} = 24$

21.  $3\sqrt{x} + 3 = 15$